refills. After the prescription expires (e.g., all refills are used) the person, or someone caring for them, may need to call a doctor or caregiver to receive a new prescription. Some medications are given in pill form, which is typically a small capsule of medication designed to be taken orally or may be a suppository. A pill for the purposes of these descriptions may be a prescription drug, an over-the-counter medication, a vitamin, a nutritional supplement, or any other tablet like object which is designed to be taken by the user.

[0026] The status of the prescription needs to be tracked to ensure that the prescription doesn't expire. A doctor's appointment may be necessary to get the prescription renewed (or possibly modified). Depending on the type of insurance, the medication, and/or the pharmacy (e.g., brick-and-mortar, mail order, etc.), the prescription may need to be filled in advance of the time that the medication will be needed.

[0027] Many users need to take a variety of different medications. The medications may need to be taken at different times (e.g., days, hours, etc.) and in different quantities. Medication organizers are utilized to assist in tracking the medications that they need to take. The organizers may come in various styles. For example, they may include containers where each container includes the medication that they take for a certain period (e.g., hour, day, etc.).

[0028] Certain prescriptions may require the user to monitor and/or measure certain body parameters (e.g., blood sugar) and to bring these parameters to the doctor for review when it is time to renew or modify the prescription. This may require the user to keep detailed records and remember to bring them to the doctor. Some users may have limited mobility so that getting to the pharmacy to get a prescription filled or getting to the doctor to provide the tracked parameters may be a hardship.

SUMMARY

[0029] In one aspect of the present disclosure, a pill dispenser includes a housing, a pill-dispensing mechanism, a receptacle, a first pill-viewing camera, an identifying camera, one or more processors, and a storage medium. The housing defines an opening. The pill-dispensing mechanism is disposed within the housing and is operatively coupled to the opening. The receptacle is operatively coupled to the housing. The receptacle may be a cup holder configured to receive a cup. The first pill-viewing camera is positioned to capture an image of the receptacle. The identifying camera is positioned to capture an image of an area adjacent to the housing. The identifying camera may be a panning camera. The storage medium may include instructions for identifying a face (e.g., the position of the face) as indicated by the panning camera and panning the camera towards the face to center the face. The one or more processors are in operative communication with the pill-dispensing mechanism, the first pill-viewing camera, and the identifying camera.

[0030] The storage medium stores one or more processor-executable instructions (e.g., executable by the one or more processors) for: instructing the pill-dispensing mechanism to dispense a pill; instructing the first pill-viewing camera to capture a first image of the pill; determining a presence of the pill within the first image; instructing the first pill-viewing camera to capture a second image; determining an absence of the pill within the second image; and instructing the identifying camera to capture a third image. In some specific embodiments, the presence of the pill within the first image (e.g., the image of the pill is within the first image) and the absence of the pill within the second image (e.g., the image of the pill is not within the second image) may be used to determine compliance (e.g., presence and absence within a time frame may be considered as compliance and/or may be a prerequisite for a determination of compliance). The storage medium may include instructions for identifying an authorized user and the pill within the third image to determine compliance, identifying an authorized user and a bottom of a cup within the third image to determine compliance, and/or decoding a bar code within the third image.

[0031] In another aspect of the present disclosure, the pill dispenser is configured for insertion into a dock. The dock may supply power to the pill dispenser and a communications link to a monitoring client.

[0032] In another aspect of the present disclosure, the storage medium further comprises processor-executable instructions configured for execution by the at least one processor for determining compliance has occurred if the first image includes an image of the pill and the second image does not include another image of the pill.

[0033] The storage medium may include instructions for instructing the identifying camera to capture the third image after a predetermined amount of time after the pill is dispensed by the pill-dispensing mechanism.

[0034] In another aspect of the present disclosure, the pill dispenser includes a button operatively coupled to the housing. The button is in operative communication with the one or more processors. The storage medium may further include instructions for dispensing the pill only when the button is pressed and/or for instructing the identifying camera to capture the third image when the button is pressed (e.g., to capture an image of the person pressing the button, for example). Additionally or alternatively, the storage medium may include instructions for instructing the identifying camera to capture a plurality of images including the third image in accordance with a predetermined schedule when the button is pressed. The unauthorized user may be determined during an authorization algorithm to authorize the dispensing of the pill.

[0035] In yet another aspect of the present disclosure, the storage medium may include instructions for instructing the identifying camera to capture a series of images until the at least one processor identifies the presence of at least one face in a captured image of the series of captured images when the button is pressed. The storage medium may include instructions for issuing an alert in response to the determined unauthorized user.

[0036] The storage medium may include instructions for determining that a face within the third image is an unauthorized user and communicating the third image and an indication that the unauthorized user is within the third image to a server.

[0037] The pill dispenser may include a storage medium having instructions for storing the third image in the storage medium and/or encrypting the third image within the storage medium. The third image may be encrypted using a public key of a pair of asymmetrical encryption keys. The encrypted third image may be communicated to a server via a communication component of the pill dispenser.

[0038] In another aspect of the present disclosure, the storage medium may include instructions for determining whether a face within the third image is an authorized user